

SUCCESSION OF THE MANGROVE VEGETATION OF BOMBAY AND SALSETTE ISLANDS

BY

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(*With two plates*)

INTRODUCTION

While studying the ecology of the mangrove vegetation of Bombay and Salsette Islands, it was thought that it would be interesting to study the succession of the mangroves and its governing factors. Previously Blatter (2) studied the mangroves of Bombay and its biology; Biswas (1) made a comparative study of Indian species of *Avicennia*. Similarly Cooke (3) has described some of the species in his Flora of the Presidency of Bombay. But no attempt had so far been made to trace the succession of the mangroves. Due to earlier detailed study of rocks, soil salinity, soil humidity and biotic factors of the mangroves by Navalkar & Bharucha (4), it has been possible to trace out, in the present work, the different stages of the succession.

The existing mangrove vegetation in Bombay and Salsette Islands is spread on the shores of the creeks and coast of the surrounding sea. These shores of the creeks are an alluvial deposit of recent formation, as has been previously mentioned in the earlier work (4).

THE VARIOUS STAGES OF MANGROVE VEGETATION

The succession of the mangrove vegetation is governed by four factors: (1) Disintegration of rocks, (2) Soil salinity, (3) Soil humidity and (4) Biotic factors.

Due to the biotic influence, the mangrove vegetation is fast disappearing from the coasts of these islands; plants are either cut by the inhabitants near by for fuel, or uprooted and eaten away by cattle, as fodder. In Bombay there is a constant cutting and grazing of the mangrove vegetation, so that plants like *Avicennia alba* Blume, which normally grow into trees, are never seen here except as shrubs. This intensive cutting and browsing has resulted in the almost total elimination of some of the species; *Lumnitzera racemosa* seen on the shores of Bandra in 1934, now is there no more. Another important biotic factor resulting in the gradual disappearance of this vegetation is sewage. At Worli, Dadar and Bandra near the mouths of the sewage disposal pipes even hardy species like *Avicennia alba* Blume are unable to grow, and it will be interesting to find out what exactly is the factor responsible for this.

There are about 12 mangrove species round about Bombay and Salsette. Of these only one seems to be predominant, viz. *Avicennia*

alba Blume. Hence this mangrove association can be named as *Avicennia alba* Association, consisting of the following species :

- (1) *Avicennia alba* Blume.
- (2) *Avicennia officinalis* Linn.
- (3) *Acanthus ilicifolius* Linn.
- (4) *Aegiceras majus* Gaertn.
- (5) *Bruguiera gymnorrhiza* Lam.
- (6) *Ceriops candolleana* Arn.
- (7) *Excaecaria agallocha*. Linn.
- (8) *Lumnitzera racemosa* Willd.
- (9) *Kandelia rheedii* Wight. & Arn.
- (10) *Rhizophora mucronata* Lam.
- (11) *Sonneratia acida* Linn.
- (12) *Sonneratia apetala* Ham.

First Stage.

(a) This association at its optimum stage of development is to be seen on the foreshores of the creeks, where the tidal water bathes the vegetation twice daily, in other words this association lies between low and high tide lines. But it is rarely that all the species mentioned above are found at a time. It is only in such far away places as Ghodbunder that there are possibilities of finding a complete association. But this, too, has in recent years been made impossible by man. Ruthless cutting has resulted in the destruction and disappearance of almost all the species except *Avicennia alba*. So that to speak of *Avicennia alba* Association today is a misnomer. It is for this reason that in the present study not much attention has been paid to other species except *Avicennia alba*.

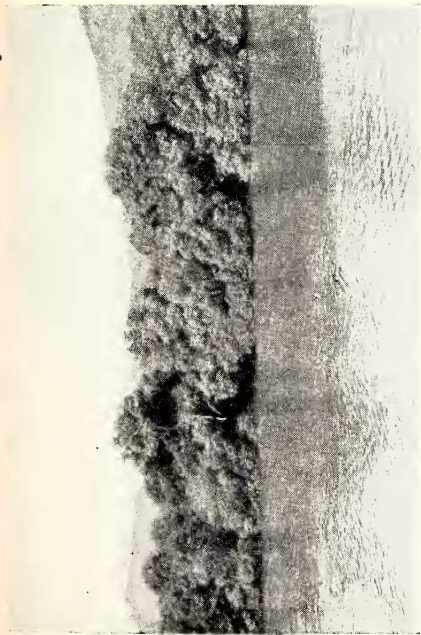
Second Stage.

(b) In those places where the shore is broad and extends inwards passing the high tide line, the vegetation changes with decreasing salinity of the soil. As mentioned above, due to the great influence of cutting, most of the species have disappeared from the first stage except *Avicennia alba* and *Acanthus ilicifolius*. These persist with increasing distance from the shore due to their high germination capacity and form the second stage of succession. This means that this stage of *Avicennia alba* and *Acanthus ilicifolius* is found on higher ground and in less saline soil than the main association.

(c) However it is found that in those areas where sweet water from rivers mingles with that of the creek, as at Mumbra, where Ulhas river flows, the main association is deflected to a stage dominated by *Ceriops candolleana* and *Acanthus ilicifolius*.

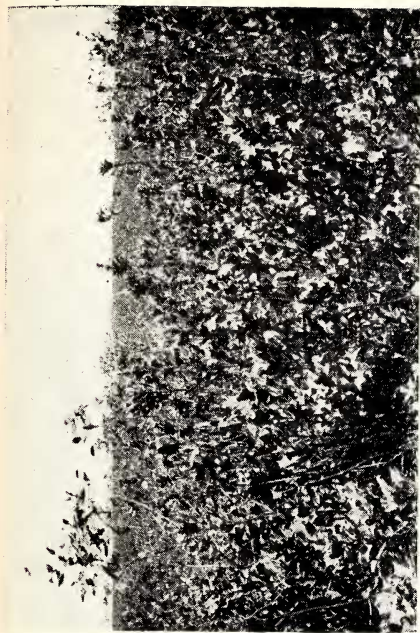
Third Stage.

(d) With increasing biotic factors and greater distance from the shore *Acanthus ilicifolius* disappears and the 2nd stage then turns into a pure stage of *Avicennia alba*. This is probably due to the hardness of the plant and its higher range of adaptability, for it is found also on slightly weathered rocks at Colaba, Mahaluxmi, and Worli.



1ST STAGE.

Avicennia alba Association (optimum stage) from Uran—near Bombay.



2ND STAGE.

Avicennia alba and *Acanthus ilicifolius* from Bandra.



2(A) STAGE.

Ceriops candolleana and *Acanthus ilicifolius* from Mumbra.

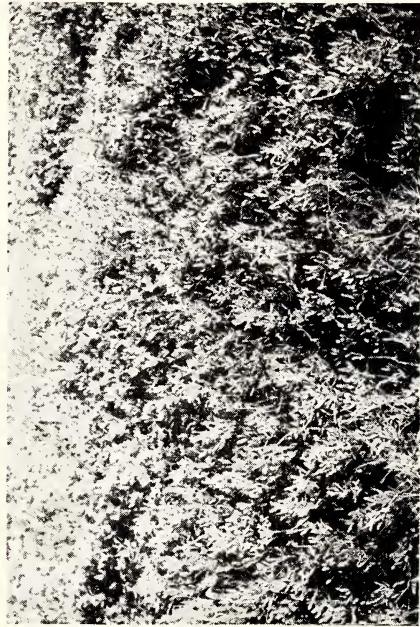


3RD STAGE.

Avicennia alba from Bandra.

Photos

Author



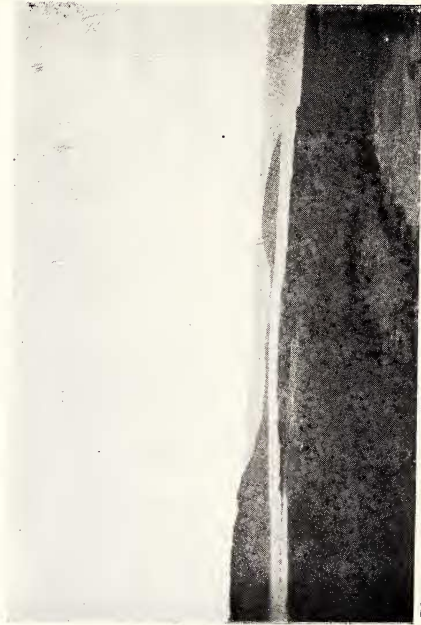
4TH STAGE.

Sesuvium portulacastrum from Vadala.



5TH STAGE.

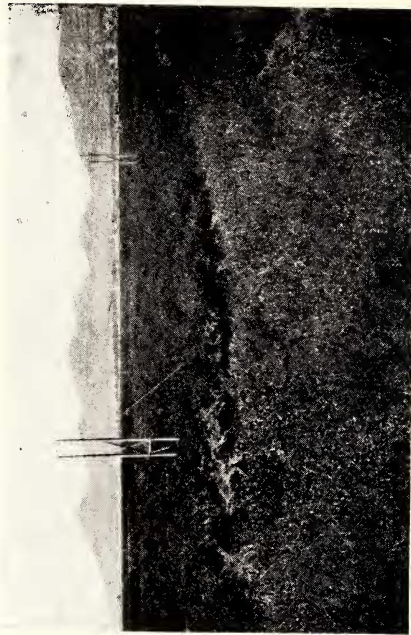
Sesuvium portulacastrum and *Aeluropus repens* from Mumbra—Diwa.



6TH STAGE

Aeluropus repens and *Paspalum varinatum* from

Photos



Author

Glomerales inverte from Mumbra-Diwa